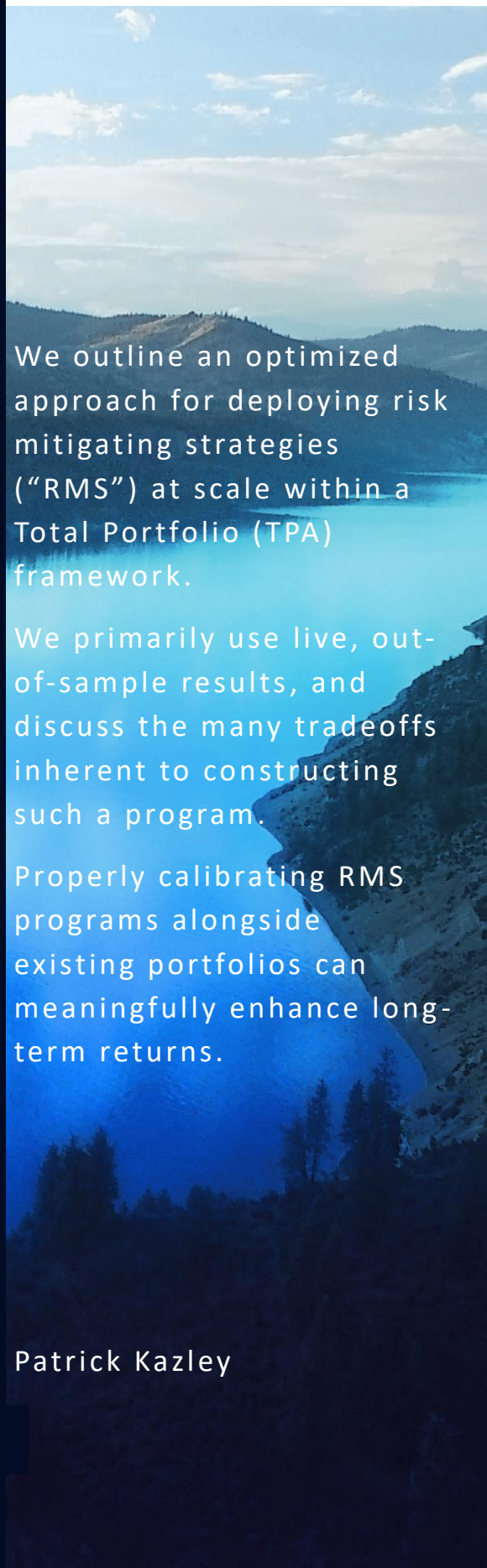
ONERIVER
ASSET MANAGEMENT

The Perfect Hedge

An Allocator's Guide to Constructing a Risk Mitigation Program for the Total Portfolio



We outline an optimized approach for deploying risk mitigating strategies ("RMS") at scale within a Total Portfolio (TPA) framework.

We primarily use live, out-of-sample results, and discuss the many tradeoffs inherent to constructing such a program.

Properly calibrating RMS programs alongside existing portfolios can meaningfully enhance long-term returns.

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A Framework for the Perfect Hedge

Outside of a Japanese garden, there is no such thing as a perfect hedge.[1] Yet, One River has made it our mission to go for it anyway, because risk mitigation (even when imperfect) meaningfully improves portfolios – to the order of ~1.5x higher annual returns on a lower downside volatility over the ~11-year out-of-sample period.[2]

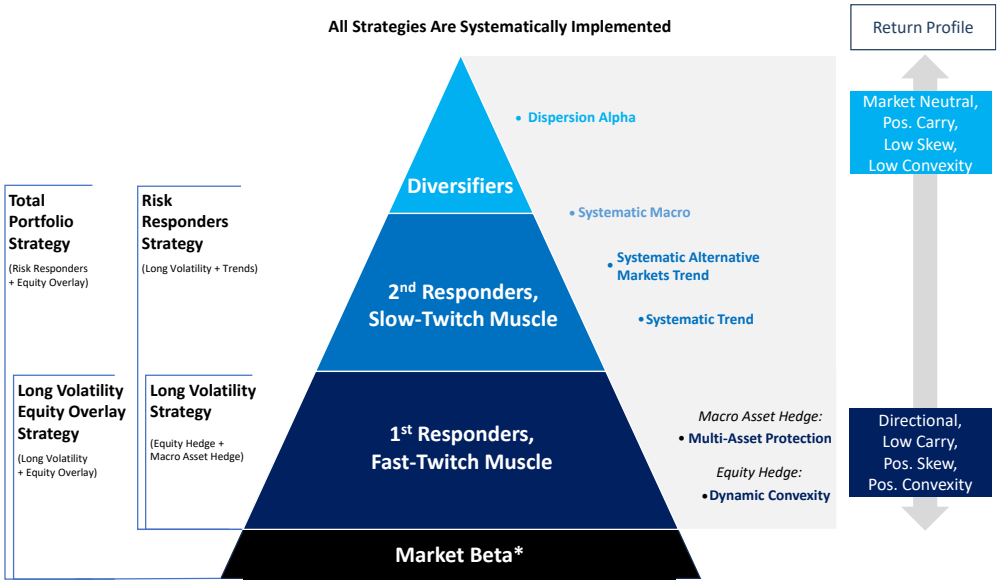
The ideal risk mitigation portfolio requires a few distinct portfolio ingredients, many of which have been a focus of One River since our inception. Through our latest acquisition, we have taken a meaningful step towards deepening our inventory of these strategy ingredients to protect portfolios against an even wider array of future market scenarios. **Exhibit 1** below outlines our approach to defending portfolios over the long-term, with the objective of improving total portfolio compounding. We break down defensive investing into three distinct categories[3]:

1st Responders (Long Volatility): i.e., the "fast-twitch muscle" of the portfolio, is designed to hedge procyclical bets in the portfolio. Explicitly defensive long volatility hedging strategies belong here – which should neither embed short volatility, nor seek to engineer positive carry, as doing so necessarily harms the objective of delivering protection. These strategies should help in sudden declines, but might not help in gradual declines. **Equity Hedges and Macro Asset Hedges play a crucial role**, require tradeoffs**,** and should always deliver explicit defense.

2nd Responders (Trend): i.e., the "slow-twitch muscle" of the portfolio. Systematic Trend Following strategies belong here. Prolonged declines, such as the Tech Bubble, the GFC (before Lehman), and 2022 are prime examples. Such strategies necessarily expose themselves to reversal risks (i.e., risk of a sudden pivot away from recent trends). Trend can't be relied upon in a sudden crisis, but is much more dependable as a crisis deepens. **Model and signal diversification are critical** for reducing path dependency and large reversal risks.

Diversifiers: These strategies are optional for mitigating portfolio risks, but if included should raise the average / benign market return for risk mitigation solutions, and importantly **not be a source of short volatility or concavity.** Capital-efficient, defensive liquid hedge funds are ideal, to not get in the way of explicit defensiveness elsewhere.

Exhibit 1: One River's Risk Mitigation Solutions Framework



*For illustrative purposes only. Source: One River. Past performance does not guarantee future results. *Market betas may meet the definition of first responders, depending on one's tolerance for accepting correlation risk.*

[1] A quote unabashedly borrowed from an industry colleague.
[2] As coved within Exhibits 5,10, and 12 in this paper.
[3] An investment framework popularized by Meketa Investment Group.

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Implementation Matters: Different Challenges Require Distinct Solutions

There are many important design choices to consider when constructing and implementing protective portfolio exposures. The challenge allocators face when incorporating risk mitigating strategies is that they categorically deliver low expected returns in benign environments. This is why allocators should combine risk mitigation strategies (RMS), with procyclical portfolio exposures like equities. Doing so should meaningfully improve total portfolio compounded returns.

Improved compounding for the Total Portfolio is especially possible if one capitalizes on the inherent capital efficiency of a derivatives-based implementation. For instance, **fully funded 1st and 2nd Responder programs can generate 15-25% return volatility on just ~2-15% underlying capital usage.** Which means that the fully funded solutions presented in this piece can be readily stacked on top of equities (portable alpha) or partially funded through separately managed accounts, to overlay the solution thereby reducing balance sheet usage.[4]

RMS construction begins by identifying the types of difficult market environments that most meaningfully impact the current portfolio. The "perfect hedge" for most doesn't just deliver positive convexity in the midst of chaos, it also likely needs to deliver returns during other difficult environments for markets. **Exhibit 2** is designed to help allocators 1) identify portfolio ingredients that solve their unique portfolio challenges, and also 2) acknowledge which strategies might not fully address their portfolio needs.

These simple frameworks are a constructive starting point, as they encourage minimal overfitting / overengineering, by focusing on broad types of environments and expected strategy behaviors during them. Between identifying strategy types in **Exhibit 1**, and pairing those with the types of environments one wishes to protect against using **Exhibit 2**, one can begin constructing an RMS program to maximize Total Portfolio effect. For most investors, a balanced allocation across 1st Responders, 2nd Responders, and Diversifiers is the optimal mix.

Exhibit 2: One River's Ingredients Across Various Challenging Equity Environments

For illustrative purposes only. Source: One River. Past performance does not guarantee future results.

[4] Maximizing capital efficiency is a key aspect of maximizing total portfolio benefit from RMS strategies, and is why we have structured One River as a solutions firm.

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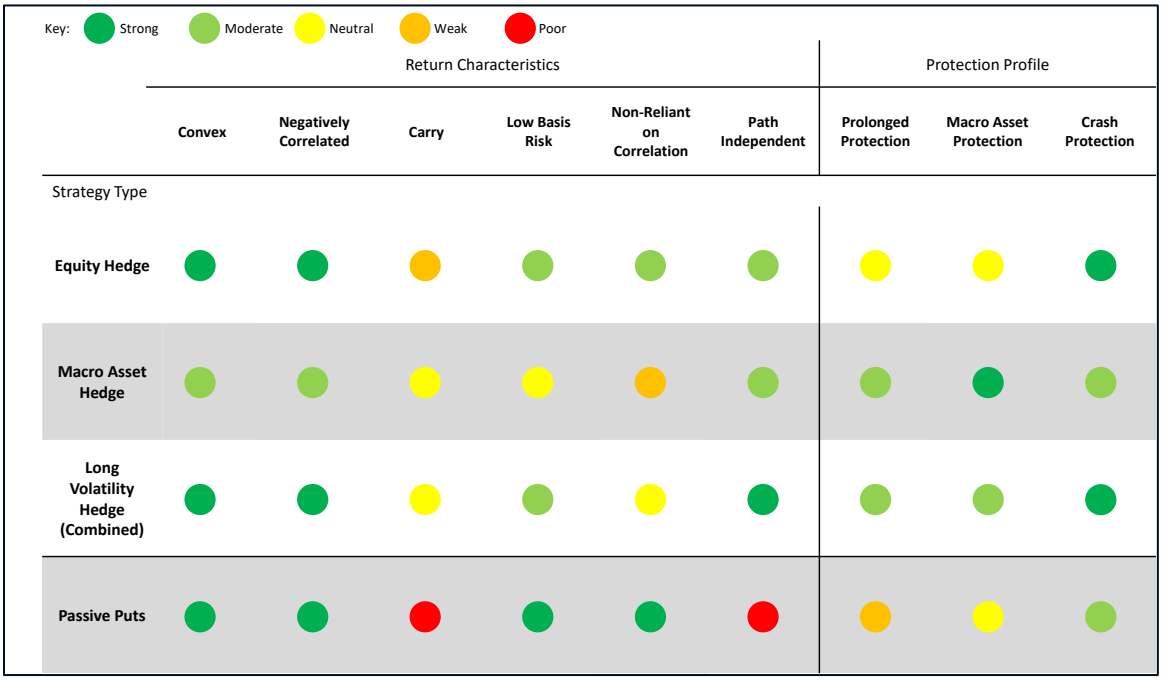
First Responders: There When You Need Them, But Not Always When You Want Them

Without much skill, one can be paid to protect their portfolio by combining highly asymmetric, convex hedges with the market(s) being protected in a capital-efficient manner, and gradually rebalancing along the journey. With skill, the impact can be profound. To maximize the impact that explicitly defensive strategies have on the portfolio, it is important to maximize certain characteristics (covered below), and importantly not permit these strategies to drift into unproductive accommodations such as forcing flat/positive carry or targeting Sharpe ratios. As we've remarked, a good hedge should always be there when you need it, but not necessarily always when you want it.

Exhibit 3 below highlights some key considerations when constructing a composite of long volatility exposures:

- **Convex:** Positively skewed, asymmetric, and nonlinear in its payoff profile
- **Negatively Correlated:** Inversely related to the market(s) being hedged
- **Carry:** Minimal cost per unit of defensive return expectation
- **Low Basis Risk:** Minimal slippage in asset class, tenor, and instrument type versus markets being hedged
- **Non-Reliant on Correlation:** Structural crisis hedges, not long-term correlation assumptions
- **Path Independent:** Minimal exposure to adverse paths, not sensitive to precise types of market declines

Exhibit 3: Key Characteristics of an Explicit Hedge (1st Responders)



For illustrative purposes only. Source: One River. Past performance does not guarantee future results.

Equity Hedges benefit from: high convexity, reliable negative correlation to equities, and low basis risk / path dependence, which makes them ideal for hedging chaotic declines (especially large ones). The cost is that they tend to mechanically deliver benign market negative carry. To the Total Portfolio, this negative carry doesn't really matter, as one can pair Equity Hedges with additional equity risk to participate in the right and left tails, by adding more convexity than additional equity risk to the total portfolio.

The low basis risk of Equity Hedges is responsible for their more pronounced benign market negative carry. The more direct a hedge is, the stronger the headwind becomes when that hedged market is doing well. To mitigate the negative carry while preserving as much protection as possible, we adopt a three-pronged equity hedge approach:

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1. *Dynamic Protection* – Long-only volatility timing. Best bleed-to-convexity ratio, but timing risk exists.
2. *Always-On Protection* – Fixed downside rain-or-shine hedges, typically long options-based. Highest cost.
3. *Episodic Protection* – Highly convex hedges that require a trigger or catalyst to justify their cost.

We have found that a diversified composite of sub-strategies that incorporate these three dimensions of equity hedging can deliver a return profile that has reasonable carry, highly positive skew, is protective in immediate declines / deleveraging events, and is convex in major chaotic crises that play out over days, weeks, and months.

Macro Asset Hedges offer more attractive benign carry and can also deliver more protection in extreme moves for macro assets (rates, commodities, FX, etc.), while providing protection in extreme equity declines. Definitionally, this represents some basis risk to equities, although that basis risk can be meaningfully mitigated through diversification of macro exposures. Often, such hedges look to historically "safe haven" assets like bonds, gold, USD, JPY, which can be exposed to changing correlation structures. These hedges are highly diversifying to equity hedges, in that they are often driven by economic linkages and fundamental factors, versus purely technical ones.

Long Volatility Hedges (Combined) that aggregate Equity and Macro Asset hedges in a capital-efficient manner likely represent the optimal mixture for most allocators. Consistent with our frameworks above, One River offers Equity, Macro Asset, and Combined Hedges. **Exhibits 4 and 5** below demonstrate both the standalone and portable alpha[5] implementations of these hedging programs over their respective live periods. As can be observed, all three programs have returned positively despite their explicitly defensive exposures (and negative carry profiles), and each has meaningfully improved equity portfolios – even over one of the strongest ever periods for equities.[6]

Lastly, on monetization. A hedge is only as useful as its monetized post-crisis value. We wrote a paper on the tradeoffs between *preemptive monetization,* or the practice of taking chips off the table as one's hedge gains significantly in value, versus a more *reactionary monetization* of waiting for the crisis to begin stabilizing first. We've seen significantly higher compensation from hedges that are predominantly reactionary in their monetization approach. However, we also embed meaningful elements of preemptive monetization to balance the need for delivering convexity in major chaotic declines with the desire to monetize V-shaped market declines.

Exhibit 4: Live Gross Composite Returns, One River Equity, Macro Asset, and Combined Hedges (Standalone)
April 1, 2015 - May 31, 2026

Equity Hedge

Apr 2015 to May 2026	Equity Hedge	S&P 500 TR
Ann. Ret	4.6%	14.3%
Ann. Vol	15.9%	15.2%
Ann. Downside Vol	2.1%	10.2%
Sharpe	0.2	0.8
Sortino	1.2	1.2
Skew	6.9	-0.4
Corr. to Equities	-0.4	-
Apr - Dec 2015	5.6%	0.4%
2016	-3.2%	12.0%
2017	-6.3%	21.8%
2018	21.6%	-4.4%
2019	-3.1%	31.5%
2020	45.2%	18.4%
2021	-2.5%	28.7%
2022	-2.8%	-18.1%
2023	-0.9%	26.3%
2024	-3.0%	25.0%
2025	14.6%	17.9%
2026 YTD	-2.8%	11.3%

Macro Asset Hedge

Apr 2015 to May 2026	Macro Asset Hedge	S&P 500 TR
Ann. Ret	3.4%	14.3%
Ann. Vol	14.2%	15.2%
Ann. Downside Vol	5.7%	10.2%
Sharpe	0.1	0.8
Sortino	0.2	1.2
Skew	4.1	-0.4
Corr. to Equities	-0.3	-
Apr - Dec 2015	9.6%	0.4%
2016	-7.4%	12.0%
2017	-4.4%	21.8%
2018	0.9%	-4.4%
2019	-5.1%	31.5%
2020	31.7%	18.4%
2021	-5.3%	28.7%
2022	9.9%	-18.1%
2023	3.1%	26.3%
2024	5.6%	25.0%
2025	-3.9%	17.9%
2026 YTD	8.6%	11.3%

Long Volatility Hedge (Combined)

Apr 2015 to May 2026	Long Volatility Hedge	S&P 500 TR
Ann. Ret	4.6%	14.3%
Ann. Vol	19.8%	15.2%
Ann. Downside Vol	4.6%	10.2%
Sharpe	0.1	0.8
Sortino	0.5	1.2
Skew	7.3	-0.4
Corr. to Equities	-0.4	-
Apr - Dec 2015	12.1%	0.4%
2016	-8.0%	12.0%
2017	-8.4%	21.8%
2018	16.1%	-4.4%
2019	-7.3%	31.5%
2020	57.2%	18.4%
2021	-5.7%	28.7%
2022	4.1%	-18.1%
2023	-1.5%	26.3%
2024	-1.4%	25.0%
2025	5.1%	17.9%
2026 YTD	3.2%	11.3%

Source: One River. See disclaimer below Exhibit 5.

[5] The portable alpha construction matches the methodology as used within our Long Volatility Premium piece, by neutralizing benign market beta with additional equity risk. For our Equity Hedge, for instance, this represents a roughly 1.2:1 equity beta to Equity Hedge ratio (i.e., 120% S&P 500 + Equity Hedge).
[6] As seen in **Exhibit 13** below, the S&P 500 is between the 99th and 100th percentiles when averaging out the 10-, 15-, and 20-year rolling windows in excess of cash.

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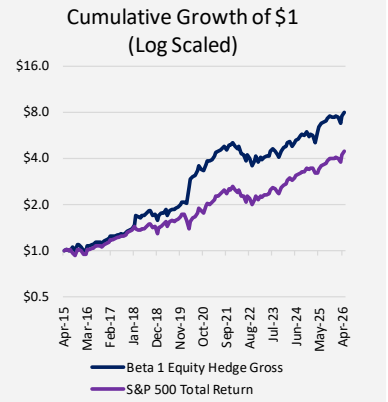
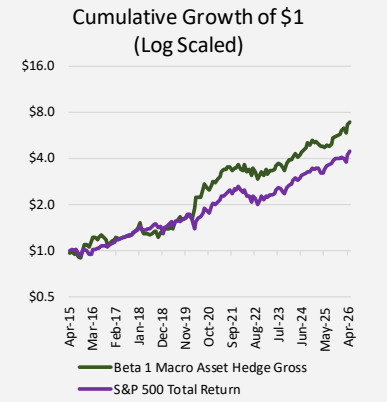
Exhibit 5: Live Gross Composite Returns, One River Equity, Macro Asset, and Combined Hedges (Portable Alpha)
Beta 1 Portable Alpha: S&P 500 + Equity / Macro / Combined Hedges Combination Portfolios versus the S&P 500
April 1, 2015 - May 31, 2026

Beta 1 Equity Hedge + S&P 500



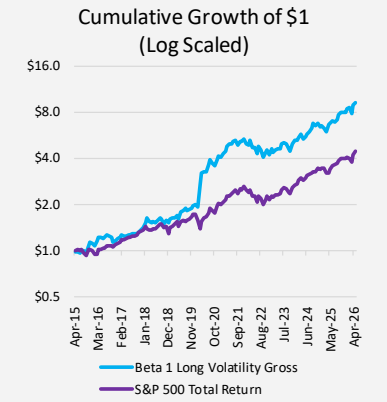
Apr 2015 to May 2026	Beta 1 Equity Hedge Gross	S&P 500 TR
Ann. Ret	20.6%	14.3%
Ann. Vol	19.3%	15.2%
Ann. Downside Vol	11.1%	10.2%
Sharpe	1.0	0.8
Sortino	1.7	1.2
Skew	0.6	-0.4
Corr. to Equities	0.6	-

Beta 1 Macro Asset Hedge + S&P 500



Apr 2015 to May 2026	Beta 1 Macro Asset Hedge Gross	S&P 500 TR
Ann. Ret	19.0%	14.3%
Ann. Vol	19.0%	15.2%
Ann. Downside Vol	9.9%	10.2%
Sharpe	0.9	0.8
Sortino	1.7	1.2
Skew	0.3	-0.4
Corr. to Equities	0.7	-

Beta 1 Long Volatility Hedge (Combined) + S&P 500



Apr 2015 to May 2026	Beta 1 Long Volatility Gross	S&P 500 TR
Ann. Ret	22.2%	14.3%
Ann. Vol	21.6%	15.2%
Ann. Downside Vol	10.2%	10.2%
Sharpe	0.9	0.8
Sortino	2.0	1.2
Skew	1.7	-0.4
Corr. to Equities	0.5	-

Source: One River, Bloomberg. S&P 500 uses the S&P 500 Total Return Index. Past performance does not guarantee future results. These composite track records only use live returns, weighted and volatility-scaled in a static manner. The Equity Hedge Beta 1 Composite represents a live pari passu implementation of the live Dynamic Convexity strategy (live returns dating back to its April 2015 inception), with an overlay of the live, volatility-scaled returns from the VIX Long Convexity substrategy from the Multi-Asset Protection strategy, equitized to a benign-market beta of 1. The Multi-Asset Hedge Beta 1 Composite is a live carve-out modified from the Multi-Asset Protection strategy (the Multi-Asset Protection strategy's inception date is September 2014) in a manner that excludes equity substrategies, and emphasizes a roughly equal risk weight to Commodity, FX, and Bond strategies, equitized to a benign-market beta of 1. The Long Volatility Hedge Composite is a live volatility-scaled combination of the Equity Hedge and the Multi-Asset Hedge, equitized to a benign-market beta of 1. Gross performance shown. Net returns would be lower after management fees, expenses, and transaction costs. See Disclaimer.

For prolonged declines, Macro Asset Hedges have a better pedigree than Equity Hedges, and there's good rationale for it. For instance, slow equity grinds may occur while inflation sets in or as monetary policy shifts, which can manifest in more turbulent moves in macro assets as a more direct release valve for certain economic phenomena. However, the embedded assumption within macro asset long volatility investing is that a large decline in equities will necessarily manifest in chaos *somewhere*. While the positive skew of long volatility investing makes this an attractive bet to take, doing so relies heavily on macroeconomic assumptions (i.e., "flight-to-safety"). In this regard, Second Responders portfolios pick up right where First Responders begin to lose reliability.

Second Responders: Model Diversification for the Win

A great deal has been written on Systematic Trend Following across the hedge fund industry.[7] Here, we focus on Trend's role within a risk mitigation framework. The First Responders category covered above solves many portfolio problems in the realm of chaotic declines, but is far less useful for protracted moves. The very nature of a prolonged selloff suggests that there is no "rush to the exits" that typically creates an outsized expansion in implied volatilities. This creates space within a risk mitigation program for a Trend strategy to fill this role.

Trend, conversely, protects against prolonged declines by design. The nature of how Trend models are constructed leads to efficient identification and participation of prevailing breakouts as they unfold. This makes Trend Following

[7] Like our piece on trend's early drawdown versus deep drawdown behavior, or this piece on trend design choices, this one on the relationship between large macro asset moves and trend performance, or this one on trend as defensive macro hedge, this one on trend as a prolonged market decline protection tool, and so on.

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as a strategy an effective engine for monetizing positive and negative feedback loops in markets. When certain markets continually crescendo higher or tumble lower, Trend tends to produce outsize gains. Market moves don't need to be highly *turbulent* in order to extract meaningful returns for Trend, just *large in magnitude* – and that's the unique value that trend can deliver to a risk mitigation program and portfolio alike.

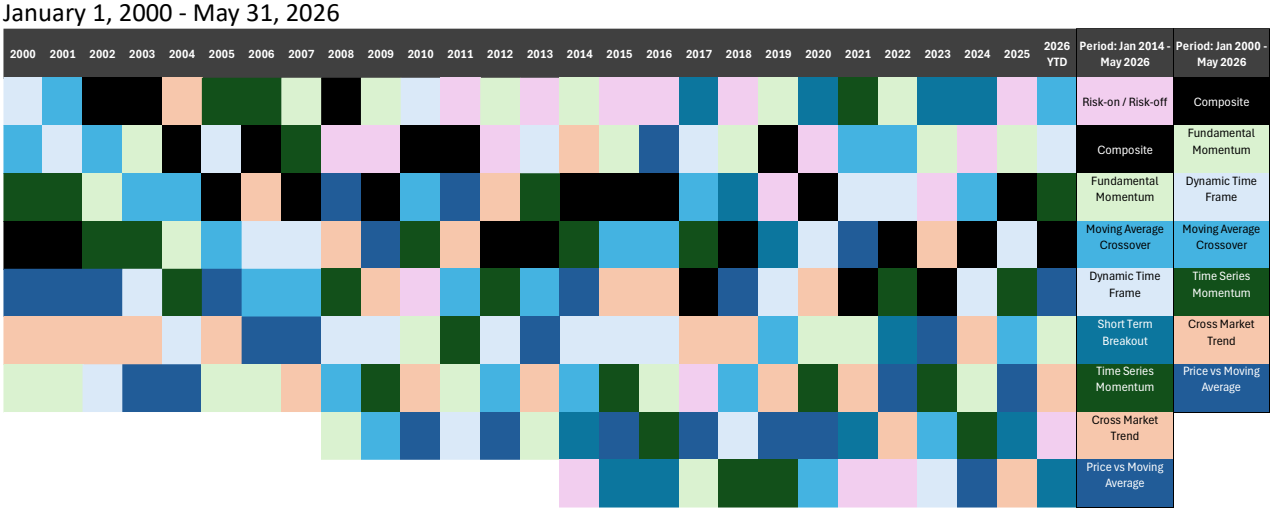
When it comes to selecting Trend managers, parsing through models can be a dizzying exercise. There are a multitude of defensible design choices – each of which can be presented as a plausible edge or enhancement to a standard Trend approach. Yet, we routinely observe "simple" Trend portfolios produce meaningful outperformance over periods that matter for investors. The out-of-sample evidence is that complexity in model construction for a pure Trend process usually succeeds in producing diversification (differently timed wins and losses versus a basic Trend), but not necessarily better returns over the long run – so it's best to embrace both.

Here are some of the important design choices when constructing a composite of Trend managers:

- **Signal type:** time series momentum, moving average crossovers, fundamental momentum, etc.
- **Horizon:** short-term (Daily - 2 months), intermediate-term (1 - 8 months), or long-term (8+ months)
- **Integrated vs. Segregated Models:** Integrated multi-asset optimization or segregated asset class models
- **Investment Universe:** Core markets, alternative markets, more/less liquid, non-futures markets, etc.
- **Risk Allocation:** Risk parity approach versus signal-driven concentration
- **Volatility Targeting:** Constant versus dynamic volatility targeting
- **Purity of Trend:** Price versus fundamental momentum, overextended / trend exhaustion signals, etc.

Exhibit 6 examines 25+ years of Trend performance by signal type, including both common (Time Series Momentum, Price Versus Moving Average, etc.) and relatively less common (Fundamental Momentum, Dynamic Time Frame, etc.) expressions of Trend. The Composite represents a simple average of these implementations (we examine two distinct time periods, the latter window beginning when newer models have sufficient data). Visually, you'll notice that the best performer year-by-year changes drastically, and that the composite of signals is rarely the best performer over short-term periods (or even multi-year periods). However, over the long-term periods, the composite tends to do well. Which is why allocators and managers alike are best suited to deemphasize single year or even multi-year windows, and instead focus on combining a number of sensible ex-ante model choices.

Exhibit 6: Multi-Asset Trend Relative Risk-Adjusted Performance by Signal Type by Year
January 1, 2000 - May 31, 2026



Source: One River. Past performance does not guarantee future results. See Disclaimer. Represents volatility-targeted simulated returns by trend model, over a consistent multi-asset universe. For illustrative purposes only.

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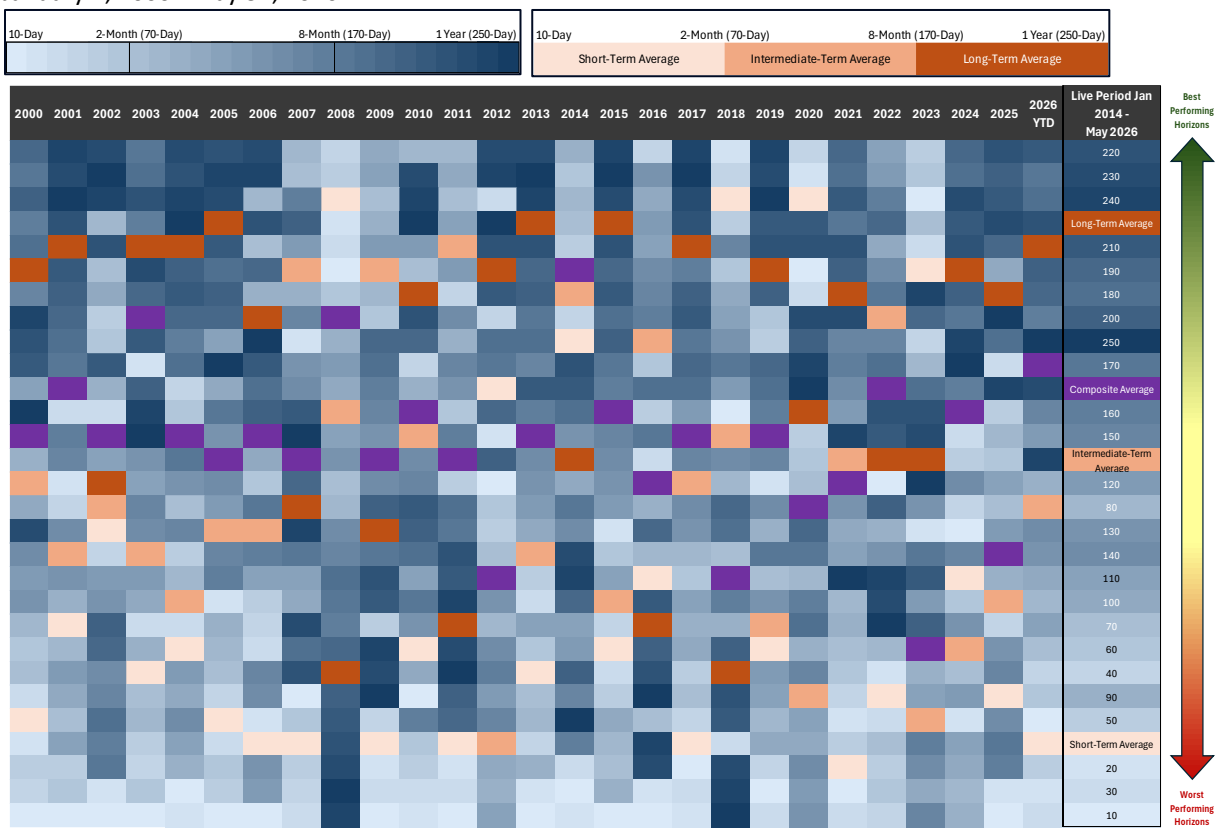
A similar experiment can be run across other design choices. **Exhibit 7** shows how different time horizons have fared for multi-asset Trend over the same period. For our process, we tend to favor intermediate / long-term horizon Trends, with only some shorter-term aspects to help the portfolio with defensiveness. As can be seen in the Exhibit, certain difficult equity periods like the GFC (2008), COVID (2020), and the 2018 Vol-Spike / Rate Hike period favored short term horizons, while full sample the longer horizons win out (and by a sizable margin).

Exhibit 7: Trend Relative Risk-Adjusted Performance by Horizon by Year, Multi-Asset Time Series Momentum
January 1, 2000 - May 31, 2026



Source: One River. Past performance does not guarantee future results. See Disclaimer. Represents volatility-targeted simulated returns by Trend model, over a consistent multi-asset universe. For illustrative purposes only.

Lastly, we explore how various Trend models are optimized. An **Integrated Model** approach takes a full universe of markets, aggregates them into asset classes, and optimizes a multi-asset Trend composite to target certain risk characteristics. Akin to a risk parity portfolio, the return and risk characteristics of one market can directly impact the desired positioning in another market. This can be useful – for instance, if correlations between a subset of markets or asset classes picks up, then the Integrated Model will tend to reduce exposure to that collection of underlying markets. All else equal, this will tend to avoid overconcentration. Conversely, a **Segregated Model** approach will aggregate very similar markets into sub-groupings and optimize portfolios at the sub-group level. Here, positions in one group are not influenced by the return and risk characteristics of another group. This can be useful, too – for instance, when profitable trends across certain markets share a common economic driver, and thus generate gains in a correlated manner. Model segregation in this instance will lead to less constrained exposure to each of those underlying markets, increasing the potential for major trend capture. **Exhibit 8** examines the performance of these different optimization approaches, with similar conclusions to the previous two charts.

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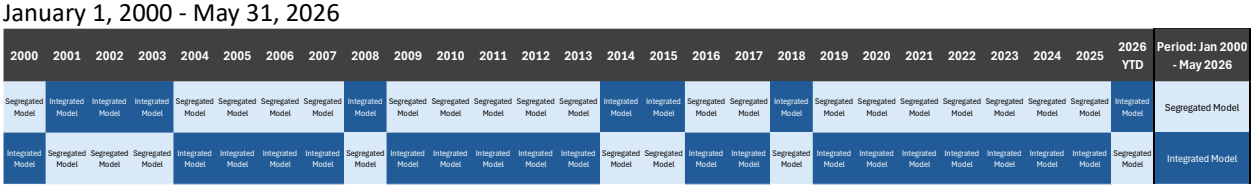
Exhibit 8: Trend Relative Risk-Adjusted Performance for Integrated vs. Segregated Model Multi-Asset Approaches
January 1, 2000 - May 31, 2026



Source: One River. Past performance does not guarantee future results. See Disclaimer. Represents volatility-targeted simulated returns by trend model, over a consistent multi-asset universe. For illustrative purposes only.

One River's Trend makes use of both Integrated and Segregated approaches to optimization, and with roughly equal weight. This diversification in model construction and optimization represents a meaningful layer of diversification for our process and materially reduces expected path dependence.

To avoid an unnecessarily long paper, we limit such analyses here to these three important design choices. Our models are informed by these tradeoffs, and the intuition behind these choices going forward. A good Trend portfolio pursues a pure expression of directional momentum, applied in many differentiated ways, over various speeds / horizons, across a high breadth universe, and without undue asset class or market concentration. Rather than anchor to a specific type of implementation, we favor a highly diversified composite of design choices, each of which is sensible but still likely to experience periods of over/underperformance for unknown periods of time.

For risk mitigation purposes, should Trend be "standard" or customized/modified to be more explicitly defensive? For instance, one can cap or prohibit long risk-asset beta within a Trend program, implement trailing stops to improve agility, or consider other bespoke weightings to asset classes and trend horizons to target a return profile. While we implement a defensively oriented Trend (i.e., not too long-term, with the aim to limit losses in sudden chaotic declines, and with various parameters to take on a defensive posture), we recommend caution against overoptimization. In other words, both standard Trend programs and more defensively calibrated ones like our own approach are likely a strong fit for the 2nd Responders sleeve.

Exhibits 9 and 10 examine One River's Trend strategy and also combines it with Our Long Volatility Combined Hedge, resulting in a multistrategy solution that we call Risk Responders. Both of these strategies have added material value on a standalone and overlay basis over the live period.

Exhibit 9: Live Gross Composite Returns, One River Trend and Risk Responders
December 1, 2014 (Trend) | April 1, 2015 (Risk Responders) – May 31, 2026

Trend Composite

Dec 2014 to May 2026	Trend Composite	S&P 500 TR
Ann. Ret	8.2%	13.9%
Ann. Vol	13.7%	15.1%
Ann. Downside Vol	8.7%	3.0%
Sharpe	0.5	0.8
Sortino	0.7	4.0
Skew	-0.3	-0.3
Corr. to Equities	-0.1	-
Dec-14	5.5%	-0.3%
2015	18.9%	1.4%
2016	-7.7%	12.0%
2017	12.3%	21.8%
2018	-7.8%	-4.4%
2019	11.1%	31.5%
2020	15.6%	18.4%
2021	22.6%	28.7%
2022	24.1%	-18.1%
2023	0.7%	26.3%
2024	3.5%	25.0%
2025	-4.4%	17.9%
2026 YTD	6.3%	11.3%

Risk Responders (Long Volatility + Trend)

Apr 2015 to May 2026	Risk Responders	S&P 500 TR
Ann. Ret	7.8%	14.3%
Ann. Vol	18.9%	15.2%
Ann. Downside Vol	8.0%	10.2%
Sharpe	0.3	0.8
Sortino	0.7	1.2
Skew	3.9	-0.4
Corr. to Equities	-0.3	-
Apr - Dec 2015	10.1%	0.4%
2016	-11.8%	12.0%
2017	2.9%	21.8%
2018	4.5%	-4.4%
2019	1.9%	31.5%
2020	55.1%	18.4%
2021	13.1%	28.7%
2022	21.3%	-18.1%
2023	-2.6%	26.3%
2024	-0.4%	25.0%
2025	-1.4%	17.9%
2026 YTD	6.5%	11.3%

Source: One River, Bloomberg. See disclaimer below Exhibit 9.

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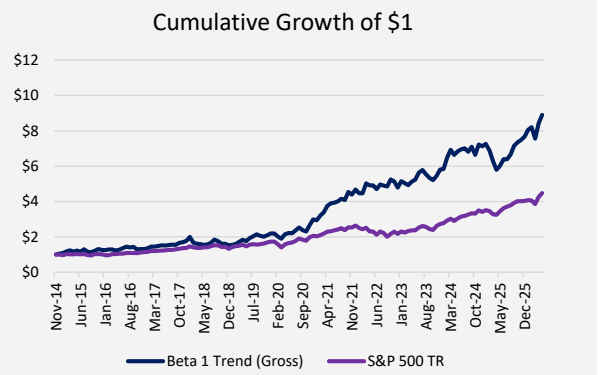
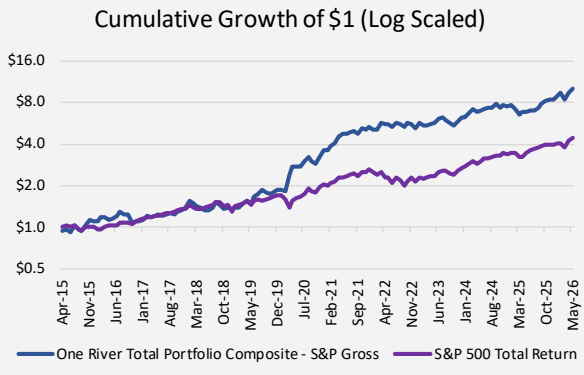
Exhibit 10: Live Gross Composite Returns, One River Risk Responders (Beta 1 Imp.)
Beta 1 Portable Alpha: S&P 500 + Trend / Risk Responders Combination Portfolios versus the S&P 500
December 1, 2014 (Trend) | April 1, 2015 (Risk Responders) – May 31, 2026

Beta 1 Trend



Dec 2014 - May 2026	Beta 1 Trend	S&P 500 TR
Ann. Ret	20.9%	13.9%
Ann. Vol	19.8%	15.1%
Ann. Downside Vol	11.0%	10.1%
Sharpe	1.0	0.8
Sortino	1.7	1.2
Skew	-0.2	-0.3
Corr. to Equities	0.7	-

Beta 1 Risk Responders (Total Portfolio)



Apr 2015 - May 2026	Total Portfolio	S&P 500 TR
Ann. Ret	22.9%	14.3%
Ann. Vol	20.9%	15.2%
Ann. Downside Vol	8.8%	10.2%
Sharpe	1.0	0.8
Sortino	2.4	1.2
Skew	0.9	-0.4
Corr. to Equities	0.5	-

Source: One River, Bloomberg. S&P 500 uses the S&P 500 Total Return Index. Past performance does not guarantee future results. Most recent month return is an estimate. The composite track records only use live returns, weighted and volatility-scaled in a static manner. The Risk Responders Composite is a combination of the Long Volatility and Trend Composites. The Long Volatility Composite is a live, volatility-scaled combination of the Equity Hedge and the Macro Asset Hedge Composites. The Equity Hedge and Macro Asset Hedge Composites are live combination of modified Dynamic Convexity and Multi-Asset Protection strategies. The Trend Composite represents a live pari passu implementation of the Systematic Trend, Systematic Alternative Markets Trend, and a live carve-out from the trend portion of the Systematic Macro strategy that uses a roughly equal risk weight to Commodity, FX, and Bond, and Equity trend strategies. The Trend Beta 1 and Risk Responders Beta 1 (Total Portfolio) Composites are additionally equitized to an ex-ante benign market beta of 1. Gross performance shown. Net returns would be lower after management fees, expenses, and transaction costs. Please see disclaimer.

Diversifiers: Good for Longevity, Counterproductive if Overdone

Do diversifiers belong in a risk mitigation program? It's a worthwhile question. The purpose of risk mitigation is to improve total portfolio returns through the addition of explicitly defensive portfolio ingredients to a risk-seeking portfolio. Therefore, market neutral alphas, especially those that do not have strong intuition for defensiveness and might inherit incidental market exposure at the wrong time, may work against improved total portfolio outcomes.

However, despite the strong long-term evidence in favor of it, many investors find explicitly defensive allocations difficult to embrace, given their relatively low expected standalone returns. The Total Portfolio Approach, and the evaluation criteria it encourages, provide allocators with an enhanced framework to showcase the benefits of risk mitigation (simply, does adding risk mitigation improve the Total Portfolio's returns?).

At some level, **standalone returns matter**. They certainly matter for improving the psychology of an allocation – high frequency positive returns have an outsized impact on investment boards, even if an unconstrained pursuit of such returns tends to amplify losses when it matters most for the portfolio. We believe that diversifiers may have a role to play in a risk mitigation solution for many – provided they do not import the problem into the solution by adding concave, negatively skewed return sources to a portfolio that benefits most from adding the exact opposite.

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The optimal diversifiers should have higher expected benign market carry than do 1st and 2nd responders (long volatility and trend), but they should also be constrained to not short volatility outright and limit negative skewness, which truly defeats the purpose of risk mitigation. Categorically, risk mitigation diversifiers should marginally tilt towards strategies that display positive skewness and have truly neutral to negative correlations.

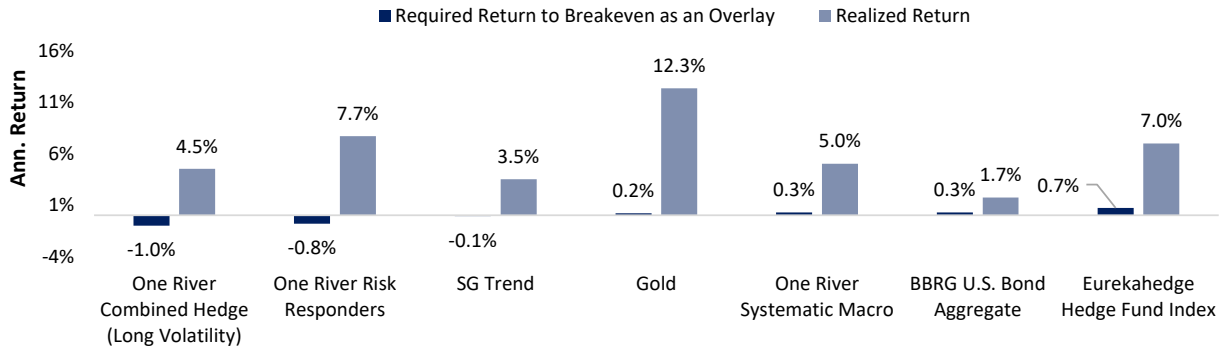
In this regard, we believe macro and alternative risk premia strategies can deliver return profiles that are consistent with the above objectives and constraints. Genuinely uncorrelated trading strategies, that are capital efficient, liquid, and that have an explicit bias towards long convexity, and a prohibition against short volatility, are unlikely to get in the way of 1st and 2nd Responders sleeves during critical moments. They are also likely to raise the average return of the overall solution. Importantly, diversifiers should occupy a minority of the risk in a risk mitigation solution so as not to dilute defensive characteristics and convexity generation.

When evaluating a category of potential diversifiers for a risk mitigation program, we generally prefer to restrict the universe to those with maximal complementarity to existing portfolio risks (in most cases, equity risk). **Exhibit 11** below revisits an analysis that we conducted in our Convexity, Correlation, and Compounding paper to answer a new question. Here, we compute the required return from a given strategy in order for the total portfolio to benefit from it. Put differently, at what level of return do various types of strategy overlays, each offering differing correlation and convexity profiles, begin to amplify equity returns?

From this exhibit, for a typical hedge fund-of-funds return profile (e.g., the Eurekahedge HF Index), a +0.7% per annum return (cumulative +8.2%) neither helps nor detracts from an S&P 500 portfolio when added as an overlay. Remarkably, the same equity-relative outcome can be achieved by adding a Long Volatility Hedge with a -1% per annum return (cumulative -10.7%) in the same overlay manner. As we stated in that piece:

"Negatively correlated, positively convex strategies can increase portfolio returns irrespective of the strategy's standalone return. Further, the more negatively correlated and the more positively convex the overlay return is, the less strong the overlay's standalone performance needs to be to improve the long-term total portfolio value."[8]

Exhibit 11: Minimum Rate of Ann. Return Required to Improve an S&P 500 Portfolio Using Overlays
April 1, 2015 – May 31, 2026



Disclaimer below Exhibit 12.

Exhibit 12 (below) examines the long-term performance of combining equity beta with various diversifiers[9].

[8] One River, 2024. Convexity, Correlation, and Compounding.
[9] Here, we disregard feasibility constraints for some overlays. For instance, one can't put on a FoHF index at 20% vol as an overlay, as there's no derivative market for it. We simply take each overlay return, and add the overlays to the S&P 500 return with monthly rebalancing for the sake of simplistic comparisons.

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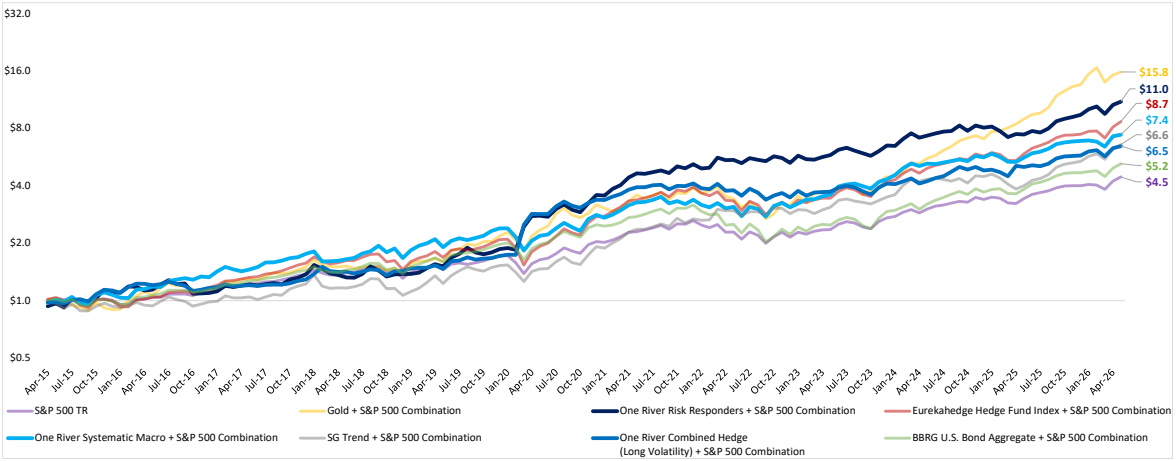
Exhibit 12: Cumulative Growth of $1 of S&P 500 vs. Gross Combination Portfolios (S&P 500 + Overlay), Log-Scaled
April 1, 2015 – May 31, 2026



Source: One River, Bloomberg. The S&P 500 returns used are the S&P 500 Total Return Index. The Gold returns used are the SPDR Gold Shares ETF. U.S. Bonds returns used are the Bloomberg U.S. Aggregate Bond Index, Hedge Fund returns used are the Eurekahedge HF Index. The One River returns use live and live gross returns. The composite track records only use live returns, weighted and volatility-scaled in a static manner. The Risk Responders Composite is a combination of the Long Volatility and Trend composites. The Combined Hedge (Long Volatility) Composite is a live combination of modified Dynamic Convexity and Multi-Asset Protection strategies. The Systematic Macro portfolio reflects the performance of the LGT Risk Premia fund, achieved under a different legal entity and fund structure. Please see disclaimer. Gross performance shown. Net returns would be lower after management fees, expenses, and transaction costs. Past performance is not a guarantee of future results.

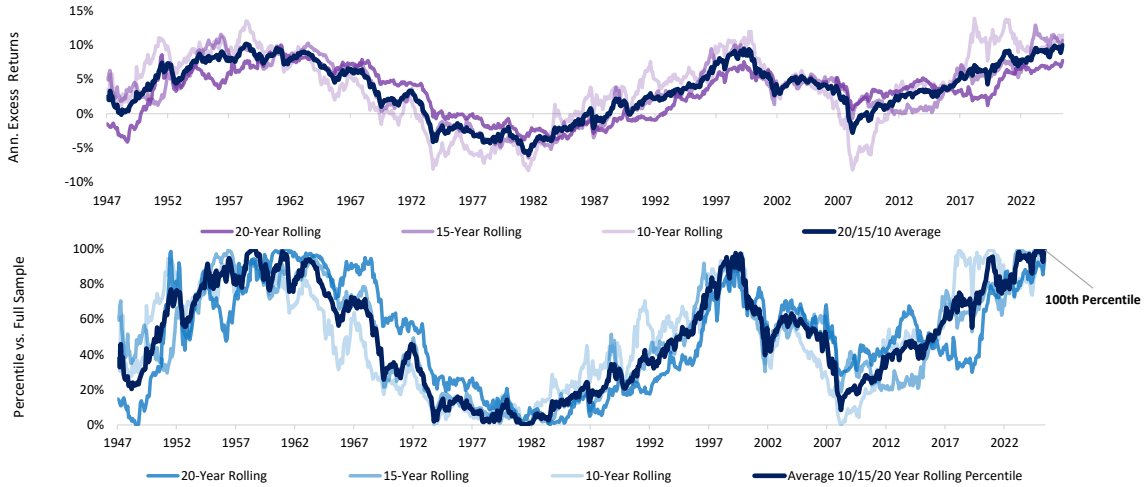
Risk Mitigation: What Further Evidence Do You Need?

The empirical support for adding risk-mitigating strategies to risk-seeking portfolios is well documented – and yet adoption is not widespread across institutional portfolios. This is mostly attributable to faulty evaluation criteria, or the tendency to evaluate standalone performance versus contribution to total portfolio outcomes. The Total Portfolio Approach is implemented for this purpose: to correctly measure each line item's contributions. This creates significant portfolio construction alpha for the allocators who are able to clear this evaluation hurdle.

Exhibit 13 is an important one to reflect on. In **Exhibit 12** we observed meaningful outperformance above equity markets over the recent regime for portfolios with various risk mitigating strategies. In **Exhibit 13,** we can see that the same period is among the best outcomes for equities over the preceding century. It stands to reason the next 10, 15, and 20 years might also benefit from explicitly defensive additions to risk-seeking portfolios.

However you hedge your portfolio today, it won't be perfect – but we think it's a good idea to go for it anyway.

Exhibit 13: Annualized S&P 500 Rolling Returns in Excess of Cash returns* (Top), Percentile vs. Full Sample (Bottom)
Jan 1, 1928 – May 31, 2026



Source: One River, Bloomberg, *Fama-French Data Library risk-free rate used. The equity Index used is the S&P 500 Index.

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Prior to December 2019, the Dynamic Convexity Strategy returns reflect the actual returns of the strategy within a One River managed SPC (Segregated Portfolio Company). Returns for the SPC are available upon request. Prior to December 2019, operating expenses are excluded for the net return calculation. The Dynamic Convexity SP caps expenses at 35 bps if AUM is above USD 250 million.

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